WHAT IS CLAIMED IS:

1. A reaction mass apparatus, comprising:

a baseframe with a first end having a first connection area and a second end having a second connection area;

at least one reaction mass with a first end having a first connection area and a second end having a second connection area; and

at least one first bearing mechanism that each connects one of said at least one reaction mass first connection area to said baseframe first connection area; and

at least one second bearing mechanism that each connects one of said at least one reaction mass second connection area to said baseframe second connection area,

wherein said baseframe, said at least one reaction mass, said at least one first bearing mechanism, and said at least one second bearing mechanism are arranged such that when a force is applied to said at least one reaction mass causing said at least one reaction mass to move in a direction from said first end toward said second end, a center of mass of said at least one reaction mass moves substantially linearly.

2. The reaction mass apparatus of claim 1, wherein said at least one reaction mass first connection area diagonally opposes said at least one reaction mass second connection area.

3. A reaction mass apparatus, comprising:

a baseframe with a first end having a first connection area and a second end having a second connection area;

at least one set of at least one reaction mass with a first end having a first connection area and a second end having a second connection area; and

at least one first bearing mechanism that each connects one of said at least one reaction mass first connection area to said baseframe first connection area; and

at least one second bearing mechanisim that each connects one of said at least one reaction mass second connection area to said baseframe second connection area,

wherein, within the same set, one of said at least one reaction mass is connected to another of said at least one reaction mass by one of said at least one first bearing mechanism and said at least one second bearing mechanism; and

wherein said baseframe, said at least one reaction mass, said at least one first bearing mechanism, and said at least one second bearing mechanism are arranged such that when a force is applied to said at least one reaction mass causing said at least one reaction mass to move in a direction from said first end toward said second end, a center of mass of said at least one reaction mass moves substantially linearly.

4. A reaction mass apparatus, comprising:

a baseframe with a first end having a first connection area and a second end having a second connection area;

at least one reaction mass with a first end having a first connection area and a second end having a second connection area, said at least one reaction mass having a corresponding set of at least one intermediate reaction mass, said at least one intermediate reaction mass with a first end having a first connection area and a second end having a second connection area; and

at least one first bearing mechanism that each connects said at least one reaction mass first connection area and said at least one intermediate reaction mass first connection area to said baseframe first connection area; and

at least one second bearing mechanism that each connects said at least one reaction mass second connection area and said at least one intermediate reaction mass second connection area to said baseframe second connection area,

wherein said baseframe, said at least one reaction mass, said set of at least one intermediate reaction mass, said at least one first bearing mechanism, and said at least one second bearing mechanism are arranged such that when a force is applied to said at least one reaction mass causing said at least one reaction mass to move in a direction from said first end toward said second end, a center of mass of said at least one reaction mass moves substantially linearly.

5. A reaction mass apparatus, comprising:

a baseframe, having a first end and a second end;

a reaction mass having a first end with a lower connection protrusion and a second end with an upper connection protrusion;

a first flexure having a first end coupled to an upper connection protrusion of said baseframe first end and a second end coupled to said lower connection protrusion of said reaction mass; and

a second flexure having a first end coupled to said upper connection protrusion of said reaction mass and a second end coupled to a lower connection protrusion of said baseframe.

6. The apparatus of claim 5, further comprising:

a second reaction mass;

a third flexure; and

a fourth flexure,

wherein said third and fourth flexures couple said second reaction mass to said baseframe.

7. The apparatus of claim 5, wherein said first reaction mass and said second reaction mass are aligned in parallel.

8. The apparatus of claim 5, further comprising:

a second reaction mass having a first end with an upper connection protrusion and a second end with a lower connection protrusion;

a third flexure having a first end coupled to said upper connection protrusion of said second reaction mass first end and a second end coupled to a lower connection protrusion of said baseframe; and

a fourth flexure having a first end coupled to an upper connection protrusion of said baseframe and a second end coupled to said lower connection protrusion of said second reaction mass second end.

9. The apparatus of claim 8, wherein said first reaction mass and said second reaction mass are aligned in parallel.

10. The apparatus of claim 9, wherein a stage is supported by said first and second reaction masses and is movably coupled to said first and second reaction masses such that when said stage accelerates, a resulting load is split substantially evenly between said first and second reaction masses.

11. The apparatus of claim 10, wherein said first reaction mass rotates in the opposite direction of said second reaction mass upon acceleration of said stage, resulting in a net moment reaction on said baseframe of approximately zero.

12. The apparatus of claim 10, wherein the weight of said stage is X times less than the combined weight of said first reaction mass and said second reaction mass, resulting in said first and second reaction masses moving a distance 1/X the distance of said stage.

13. The apparatus of claim 10, wherein said first reaction mass weighs substantially the same as said second reaction mass.

14. The apparatus of claim 13, wherein said stage weighs approximately 1/10 the weight of each of said first and second reaction masses.

15. The apparatus of claim 10, wherein each flexure has a length to substantially prevent quadratic effects when said reaction mass begins to rotate in reaction to acceleration of said stage.

16. The apparatus of claim 5, wherein at least one flexure is made of metal.

17. The apparatus of claim 16, wherein at least one flexure is made of aluminum.

18. The apparatus of claim 16, wherein at least one flexure is made of steel.

19. The apparatus of claim 5, wherein at least one channel is cut into each of said first end and said second end of said first and said second flexures for flexibility resulting in a geometry that simulates a hinge bearing.

20. The apparatus of claim 19 wherein said channel is rounded to avoid stress concentration.